**HYDROPUNCH SULFOLANE RESULTS**

**FIGURE 11**

**SITE CHARACTERIZATION REPORT – 2012 ADDENDUM**

**HYDROPUNCH SULFOLANE RESULTS**

39 - 48 FEET BGS

**Legend**

Sample Location Types:
- **Monitoring Well**
- **Observation Well**
- **Hydropunch**

Sulfolane Result Color-Coding:
- **Non-Detect**
- **1.4 - 14 µg/L**
- **14 - 140 µg/L**
- **140 - 1,400 µg/L**
- **>1,400 µg/L**
- **Matrix Interference**
- **FHRA Property Boundary**

**Notes:**
- **µg/L** = Micrograms per liter
- **<** = Not detected; limit of detection (LOD) listed
- **Estimated concentration**
- **Result rejected due to hydrocarbon interference**
- **Estimated result, biased high**
- **Estimated result, biased low**
- **Analysis indicates there is presumptive evidence to make a tentative identification of this compound**
- **Data flag applied based on S&W's Level II data assurance review**
- **Data flag applied based on ESI's Level IV data assurance review**

**Approximate Sulfolane isopleth in µg/L**

**Legend**

**Sample Location Types**
- **Monitoring Well**
- **Observation Well**
- **Hydropunch**

**Sulfolane Result Color-Coding:**
- **Non-Detect**
- **1.4 - 14 µg/L**
- **14 - 140 µg/L**
- **140 - 1,400 µg/L**
- **>1,400 µg/L**

**Notes:**
- **µg/L** = Micrograms per liter
- **<** = Not detected; limit of detection (LOD) listed
- **Estimated concentration**
- **Result rejected due to hydrocarbon interference**
- **Estimated result, biased high**
- **Estimated result, biased low**
- **Analysis indicates there is presumptive evidence to make a tentative identification of this compound**
- **Data flag applied based on S&W's Level II data assurance review**
- **Data flag applied based on ESI's Level IV data assurance review**

**Approximate Sulfolane isopleth in µg/L**

**Legend**

**Sample Location Types**
- **Monitoring Well**
- **Observation Well**
- **Hydropunch**

**Sulfolane Result Color-Coding:**
- **Non-Detect**
- **1.4 - 14 µg/L**
- **14 - 140 µg/L**
- **140 - 1,400 µg/L**
- **>1,400 µg/L**

**Notes:**
- **µg/L** = Micrograms per liter
- **<** = Not detected; limit of detection (LOD) listed
- **Estimated concentration**
- **Result rejected due to hydrocarbon interference**
- **Estimated result, biased high**
- **Estimated result, biased low**
- **Analysis indicates there is presumptive evidence to make a tentative identification of this compound**
- **Data flag applied based on S&W's Level II data assurance review**
- **Data flag applied based on ESI's Level IV data assurance review**

**Approximate Sulfolane isopleth in µg/L**

**Legend**

**Sample Location Types**
- **Monitoring Well**
- **Observation Well**
- **Hydropunch**

**Sulfolane Result Color-Coding:**
- **Non-Detect**
- **1.4 - 14 µg/L**
- **14 - 140 µg/L**
- **140 - 1,400 µg/L**
- **>1,400 µg/L**

**Notes:**
- **µg/L** = Micrograms per liter
- **<** = Not detected; limit of detection (LOD) listed
- **Estimated concentration**
- **Result rejected due to hydrocarbon interference**
- **Estimated result, biased high**
- **Estimated result, biased low**
- **Analysis indicates there is presumptive evidence to make a tentative identification of this compound**
- **Data flag applied based on S&W's Level II data assurance review**
- **Data flag applied based on ESI's Level IV data assurance review**

**Approximate Sulfolane isopleth in µg/L**

**Legend**

**Sample Location Types**
- **Monitoring Well**
- **Observation Well**
- **Hydropunch**

**Sulfolane Result Color-Coding:**
- **Non-Detect**
- **1.4 - 14 µg/L**
- **14 - 140 µg/L**
- **140 - 1,400 µg/L**
- **>1,400 µg/L**

**Notes:**
- **µg/L** = Micrograms per liter
- **<** = Not detected; limit of detection (LOD) listed
- **Estimated concentration**
- **Result rejected due to hydrocarbon interference**
- **Estimated result, biased high**
- **Estimated result, biased low**
- **Analysis indicates there is presumptive evidence to make a tentative identification of this compound**
- **Data flag applied based on S&W's Level II data assurance review**
- **Data flag applied based on ESI's Level IV data assurance review**

**Approximate Sulfolane isopleth in µg/L**
Approximate Sulfolane isopleths in µg/L

Legend

Sample Location Types
- Monitoring Well
- Observation Well
- Hydropunch

Sulfolane Result Color-Coding:
- Non-Detect
- 1.4 - 14 µg/L
- 14 - 140 µg/L
- 140 - 1,400 µg/L
- >1,400 µg/L

Matrix Interference
- FHRA Property Boundary

Notes:
- µg/L: Micrograms per liter
- LOD: Limit of detection
- Estimated concentration
- Result rejected due to hydrocarbon interference
- Estimated result, biased high
- Estimated result, biased low
- Analysis indicates there is presumptive evidence to make a tentative identification of this compound
- Data flag applied based on S&W's Level II data assurance review
- Data flag applied based on ESI's Level IV data assurance review

Hydropunch Sulfolane Results
49 - 58 Feet BGS

PROJECT: (PROJECT #)
PATH: V:\FHR_AK\NorthPoleRefinery\SiteCharacterization2012\MXD\Site Characterization Report – 2012 Addendum\Fig 13 Hydropunch_SulfolaneResults_49-58ft_rev1.mxd 1/24/2013 3:51:16 PM
HYDROPUNCH SULFOLANE RESULTS
59 - 62 FEET BGS

Legend

Sample Location Types
- Monitoring Well
- Observation Well
- Hydropunch

Sulfolane Result Color-Coding:
- Non-Detect
- 14 - 14 µg/L
- 14 - 140 µg/L
- 140 - 1,400 µg/L
- >1,400 µg/L
- Matrix Interference
- FHRA Property Boundary

Notes:
- µg/L: Micrograms per liter
- X: Not detected; limit of detection
- LOD: LOD listed
- J: Estimated concentration
- R: Result rejected due to hydrocarbon interference
- H: Estimated result; biased high
- L: Estimated result; biased low
- A: Analysis indicates there is presumptive evidence to make a tentative identification of this compound
- *: Date flag applied based on S&W's Level II data assurance review
- **: Date flag applied based on ESI's Level IV data assurance review

Notes:

1. Approximate Sulfolane Isopleth in µg/L.
Borings HP-1 through HP-31 will be advanced to refusal. Borings HP-32 through HP-46 will be advanced to refusal or 25 feet bgs, whichever is encountered first.

Legend
- Hydropunch Location
- FHRA Property Boundary

Notes:
HYDROPUNCH BENZENE RESULTS
12 - 18 FEET BGS

Legend

Sample Location Types
- Monitoring Well
- Observation Well
- Hydropunch

Benzene Result Color-Coding:
- Non-Detect
- 0.17 - 5 µg/L
- 5 - 100 µg/L
- 100 - 1,000 µg/L
- >1,000 µg/L

Benzene Isothet in µg/L
(Dashed where inferred)

FHRA Property Boundary

Notes:
- Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
- Result considered an estimate, biased low due to QC failures
- Result considered an estimate: field duplicate RPD did not meet data-quality objectives
- Total xylenes calculated based on individual results
- Sheen noted on sample
- Not detected; detection limit listed

Project Details:
- City: SF
- Division: ENV/IM
- DB: BGRIFFITH
- LD: PIC, PM, TM, TR
- Project: PROJECT #
- Path: V:\FHR_AK\NorthPoleRefinery\SiteCharacterization2012\MXD\Site Characterization Report – 2012 Addendum\Fig 16 Benzene_Water_12-18ft.mxd
- Date: 1/8/2013 11:39:23 AM

HYDROPUNCH BENZENE RESULTS
12 - 18 FEET BGS

Estimated concentrations listed above the detection limit (DL) and below the limit of quantitation (LOQ)

Result considered an estimate: field duplicate RPD did not meet data-quality objectives

Total xylenes calculated based on individual results

Sheen noted on sample

Not detected; detection limit listed
HYDROPUNCH BENZENE RESULTS
19 - 28 FEET BGS

Legend
Sample Location Types
Monitoring Well
Observation Well
Hydropunch

Benzene Result Color-Coding:
Non-Detect
0.17 - 5 µg/L
5 - 100 µg/L
100 - 1,000 µg/L
>1,000 µg/L

Benzene Isopeht in µg/L
(Dashed where inferred)

FHRA Property Boundary

Notes:
Results are displayed in µg/L.

< Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
< Result is considered an estimate, biased low due to QC failures
< Total xylenes calculated based on individual results
< Not detected; detection limit listed

HYDROPUNCH BENZENE RESULTS
19 - 28 FEET BGS

Notes:
Results are displayed in µg/L.

< Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
< Result is considered an estimate, biased low due to QC failures
< Total xylenes calculated based on individual results
< Not detected; detection limit listed
HYDROPUNCH BENZENE RESULTS
39 - 48 FEET BGS

Legend
Sample Location Types
Monitoring Well
Observation Well
Hydropunch

Benzene Result Color-Coding:
Non-Detect
0.17 - 5 µg/L
5 - 100 µg/L
100 - 1,000 µg/L
>1,000 µg/L

Benzene Isopleth in µg/L (Dashed where inferred)
FHRA Property Boundary

Notes:
Results are displayed in µg/L.
Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
Result is considered estimate, biased low due to QC failures
Result considered an estimate; field-duplicate RPD did not meet data-quality objectives
Total xylenes calculated based on individual results
Not detected; detection limit listed
HYDROPUNCH BENZENE RESULTS
49 - 58 FEET BGS

Legend
Sample Location Types
Monitoring Well
Observation Well
Hydropunch

Benzene Result Color-Coding:
Non-Detect
0.17 - 5 µg/L
5 - 100 µg/L
100 - 1,000 µg/L
>1,000 µg/L

Notes:
Results are displayed in µg/L.
Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ).
Result is considered an estimate, biased low due to QC failures.
Result considered an estimate; field-duplicate RPD did not meet data-quality objectives.
Total xylenes calculated based on individual results.
Not detected; detection limit listed.
Borings HP-1 through HP-31 will be advanced to refusal. Borings HP-32 through HP-46 will be advanced to refusal or 25 feet bgs, whichever is encountered first.
Borings HP-1 through HP-31 will be advanced to refusal. Borings HP-32 through HP-46 will be advanced to refusal or 25 feet bgs, whichever is encountered first.
NOTES:
1. BOLDED VALUES EXCEED ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION ALTERNATIVE CLEAN UP LEVEL FOR SULFOLANE (14 µg/L).
2. DEPTH TO WATER IS APPROXIMATE AND DOES NOT REFLECT ACTUAL GROUNDWATER CONDITIONS AT THE LOCATIONS DEPICTED IN THIS FIGURE.